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# A PROPOSED MONTANA ENERGY POLICY

## MEAC STAFF PAPER 76-5

Submitted to: Lieutenant Governor Bill Christiansen, Chairman,
Montana Energy Advisory Council

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While all of the above and more have had a hand in the shaping of this staff paper, sole responsibility rests with the authors.

# FOREWORD

House Bill 453 (Session Laws, 1975) directed the Governor to prepare and submit to the 1977 legislative session a comprehensive energy conversion policy and plan, including but not limited to alternative long-term growth goals, a statewide siting inventory, and a proposed siting policy for the coordinated siting of energy conversion facilities to meet Montana's energy needs.

Subsequently, in directing the Montana Energy Advisory Council (MEAC) to undertake this energy policy, Governor Judge clarified the mandate, directing "the energy policy and plan to be formulated in such a fashion that it will serve as a basis for the continuing development and implementation of substantive energy and growth policies for the State of Montana . . ." This paper, submitted to Lieutenant Governor Bill Christiansen, Chairman of MEAC, is the summary of the MEAC staff's considered response to that directive. It is the judgment of the authors that this summary can form the basis for a continuing energy policy for Montana.

This summary has been based upon supporting documents prepared by and for MEAC and upon extensive research and data collection noted in the references section.

In fashioning this energy policy staff paper, much of the supporting work has been carried out with a great deal of input from MEAC agencies, industry, the public, and the Citizens' Advisory Committee on Energy (CACE). A preliminary draft was distributed to all MEAC agencies and members of the CACE energy policy subcommittee for their review. This paper reflects a

careful consideration of the comments received.

While each recommendation should be considered in its own right, the single most important recommendation is for an Energy and Resource Policy Office. The creation of this office can, if supported financially and philosophically, guarantee the integrity of Montana's energy policy.

The recommended policy is for Montana State government. In carrying out its own policy, the state must continue to work together with the public, industry, and local government. All have a part to play, and the state must see that all continue to have the chance to participate.

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## INTRODUCTION

Since the 1973 oil embargo, the United States has heard recurring calls for a national energy policy. Nearly everyone agrees an energy policy is needed, but no one has a clear definition of what an energy policy is. The call for such a policy as the solution to all energy problems sometimes seems to be a way to avoid the issues. No energy policy, no matter how inspired, can avoid the hard questions confronting the public, the energy companies and the government.

It should be pointed out that Montana already has established, through its constitution and legislative policy statements, what amounts to an energy policy, although a fragmented and incomplete one. For example:

Article II, Section 3 of the constitution sets the stage by declaring that "all persons . . . have certain inalienable rights. They include the right to a clean and healthful environment and the right to pursue life's basic necessities. . . . In enjoying these rights, all persons recognize corresponding responsibilities." (Emphasis added.)

Article IX, Section 1, expands this statement by providing that "the state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations." The article gives the legislature the responsibility for administration and enforcement of this duty and directs it to "provide adequate remedies for the protection of the environmental life support system from degradation and . . . to prevent unreasonable depletion and degradation of natural resources." More specifically, Section 2 declares that "all lands disturbed by the taking of natural resources shall be reclaimed."

The intent of these articles is clear. Law-making authority to these ends is given to the legislature. The legislature and "each person", individual and corporation alike, is given the responsibility for implementation.

The legislature has implemented these articles of the constitution in a number of ways and in doing so more clearly defined the current policy. The Montana Strip and Underground Mine Reclamation Act, the Coal Conservation Act, the Major Facility Siting Act, the Renewable Resources Development Act, the Resource Indemnity Trust Act, the Clean Air Act of Montana, the Water Moratorium Act of 1974, the Water Use Act and the Montana Environmental Policy Act, are but a few of those that implicitly constitute Montana's present policy. Although this policy lacks overall coherence of purpose, it apparently indicates the wishes of the people of Montana.

House Bill 453 (Session Laws, 1975) is a legislative attempt to close the gaps and bring a unified energy policy to Montana. In responding to the mandate of House Bill 453, the intent has been to provide the framework for a coherent, comprehensive and continuing energy policy to direct future energy-related efforts.

In formulating an energy policy, the State of Montana faces two principal challenges. First, a supply of energy adequate to provide a quality life must be assured for present and future generations in Montana. Second, in meeting Montana's responsibility to provide energy to the nation, the state must institute and maintain controls over energy development sufficient to assure the preservation of Montana's unique environment. The need for balance must dominate the development of effective policy to deal with both concerns. Today the dependence is upon fossil hydrocarbons, but ultimately

renewable energy must predominate. Present needs must be balanced with the interests of the future.

This energy policy recommends applying a creative planning approach to the future. State government must begin to take a more active role in developing long-range, energy-related strategies. Such a role would promote greater efficiency in making decisions on new energy developments, and would also enable the state to pursue innovative paths to the future. Imaginative, active planning by the people and government of Montana presents the best assurance that the proper balance will be attained.

Montana's energy planning so far has been largely a reaction to the potential threat of unbridled coal development. More recently, the legislature has begun to take a different approach toward shaping the future of Montana. The renewable energy research, development and demonstration program, the renewable resource development program, and the public vote to establish a permanent trust fund with money from the coal severance tax reflect the desire of Montanans to retain something permanent from their resource heritage.

It must be recognized that the development of Montana energy resources to meet the demands both within Montana and the nation leads to environmental, social, and economic impacts of long-term significance. The provision of energy is necessary and the government should not hinder it unnecessarily, but the high standards of environmental control which have been established must be enforced to minimize the adverse effects of energy development. The legitimate demands of the nation and equally legitimate constitutional rights of present and future generations in Montana must be balanced.

Adequate energy supply in Montana can be best assured through a policy of aggressively promoting energy conservation and the development of renewable energy sources. Montana's remaining reserves of fossil fuels, particularly coal, can serve as an important bridge into the future. A rational pricing policy reflecting the true value and costs of fossil fuels would help provide time to cross that bridge by encouraging conservation and development of alternative energy sources and by increasing the available supply of fossil fuels. A balance between the current consumption of fossil fuels and the potential use of renewable energy sources must be actively promoted.

It is recognized that the development of any effective energy policy must be based both on thorough review of the best technical information and data available, and on sincere consideration of the needs and expectations of the public. These two concerns must continue to form the core of further development and implementation of a Montana energy policy.

Recent history shows that various elements of the energy situation will change, as will the needs of the public. If state government is to keep its energy policy relevant to the fluctuating energy picture, it must retain flexibility to deal with the situation, and must develop a mechanism to keep itself reliably informed of occurrences likely to affect the state. Without an understanding of the changing energy situation and the capacity to deal flexibly with it, no long-range energy policy is workable.

Central to this proposed energy policy is the need to establish a Montana energy office to provide flexibility in dealing with future energy matters and to promote greater efficiency in state government's energy-related operations.

Recommendation

The legislature should establish the Governor's Energy and Resource Policy Office by statute (16).

The need exists for comprehensive state leadership in determining the direction of Montana's energy future. The Energy and Resource Policy Office could provide the chief executive of Montana with expert staff assistance in the energy and resource area, and assist as assigned in the coordination of matters crossing agency lines or transcending agency capabilities and perspectives. In addition to staff resources, the structure and funding of the office should maximize efficiency by relying heavily on the technical expertise and research capabilities that already exist within state government and the state university system. Specific functions should include coordination of Montana energy and resource research; oversight of a comprehensive energy data system with independent analytical capability; coordination of interagency energy and resource matters; coordination of a state energy conservation program; development of an emergency energy plan; and forecasts of Montana energy supply and demand.

The proposed Montana energy policy discussed above is reflected in the specific recommendations which follow. They have been organized for presentation into seven categories reflecting the major aspects of the Montana energy situation and the proposed energy policy for the state. The components are as follows:

(1) Energy Conservation.

(2) Public Participation.

(3) Energy Data and Analysis.

(4) Siting of Energy Facilities.

(5) Energy Transportation.

(6) Energy Extraction.

(7) Energy Conversion.

There has been substantial analysis of energy issues with much yet to be done. The recommendations that follow are based on the work that has been done, and on a consideration of the highest priority issues for further study.

Montana must deal decisively with its energy problems in a managerially sound, technically competent and socially desirable manner. It is believed that the creation of the Energy and Resource Policy Office, thorough consideration of the following recommendations, and adoption of the proposed energy policy (page 39) will do much toward these ends.

## ENERGY CONSERVATION

The conservation of energy is an essential element in any energy strategy for Montana. Simply stated, it is the efficient use of energy, making a given amount do more. Conservation depends fundamentally on the elimination of energy waste, and need not cause hardship or deficiency.

Savings can be accomplished by substituting other resources, such as capital, skilled labor, time, or careful workmanship, for energy. Further savings result from the consumption of fewer goods and services, and from switching to products requiring lower energy consumption. Nonrenewable energy resources can be conserved through the use of largely untapped renewable resources.

Energy conservation and renewable energy development are not counter to Montana's economic development goals. Energy conservation will create jobs.

The Montana Energy Advisory Council, with federal financial assistance, has contracted with the Montana Energy and MHD Research and Development Institute (MERDI) for technical assistance in developing a state energy conservation plan (21). The material presented here is based on interim results of the MERDI team, and will be covered in detail in the final report due early in 1977.

### Recommendation

The legislature should adopt Montana's energy conservation plan and give careful consideration to the legislative recommendations contained therein.

In developing this plan, consideration was given to techniques for saving

energy in the residential, commercial, industrial, agricultural and transportation sectors. The first step was to analyze the waste associated with various energy uses in homes, businesses, cars and factories. The next step was to review current and future energy needs in several categories:

(1) Low grade heat (under the boiling point of water) for space and water heating.

(2) Medium grade heat (less than 250° C) for process steam and industry.

(3) High grade heat for industrial applications and electrical generation.

(4) Electricity for motors and lights.

(5) Liquid fuel for transportation.

These categories exemplify the need to match energy quality to appropriate end-use requirements. For example, space heating can be accomplished by using low-grade heat from solar collectors or rejected heat from industrial processes. The low temperature requirements of space heating would not make the best use of high BTU liquid fuel, which is more efficiently used for transportation purposes.

## Recommendation

The legislature should require the Construction Regulation Bureau to implement an energy-conservation building code, and provide for adequate funding. The code should become effective within one year after the legislative action.

Montana is one of sixteen states with the authority to require local government compliance with a statewide energy building code. In 1975, Montana enacted legislation authorizing the adoption of such a code, but it did not specify a date by which such regulations had to be adopted, and did

appropriate any funds for evaluation of various conservation codes to identify the approach most appropriate for Montana. The Construction Regulation Bureau of the Department of Administration is presently staffed by three full-time employees who also are responsible for regulating recreational vehicles, modular homes and elevators throughout the state. At current funding levels, it is impossible for the bureau to adequately meet the responsibilities of promulgating and implementing a new energy conservation building code.

## Recommendation

The legislature should implement an energy conservation program for state buildings, including evaluation of both initial purchase and lifetime operating costs of the buildings and their energy-consuming systems (life cycle costing).

Montana's state government owns and operates a large number and variety of building types that offer significant opportunities for energy conservation through more efficient management practices and retrofitting for improved thermal performance.

State government retains operational responsibilities for the full life of its buildings and can therefore take into account the future energy expenses to be incurred. Existing buildings and new state construction projects should reflect the policy of conserving energy and promoting the substitution of renewable resources for nonrenewable.

In the area of upgrading the energy efficiency of existing state buildings, it has been found that energy savings of 10 to 20 percent are possible with no additional costs other than informing maintenance personnel and occupants about the efficient management of thermostat settings, illumination levels, hot water temperature control, proper equipment maintenance and variable ventilation requirements. More significant savings could be attained for a

small expenditure by introducing minor measures such as flow reduction water faucets, double door entrances, and added insulation and weatherstripping.

## Recommendation

The legislature should explore the feasibility of amending R.C.M. 84-7405, which authorizes natural gas and electric utility companies to carry out programs for the provision of low interest (7 percent) loans to residential customers for conservation measures.

In 1975, Montana enacted legislation (R.C.M. 84-7405) which permits utilities to install or pay for the installation of energy conservation materials in dwellings at the low interest rate of seven percent per year. The state offered to subsidize this low interest loan for energy conservation by crediting the difference between the seven percent interest and the prevailing average interest rate for home inprovement loans (approximately 12 percent) against the utilities' state tax liability for the electric power producer's license tax or the corporation license tax. The Public Service Commission was authorized to make rules to implement this program.

Unfortunately, the major utilities in Montana have not chosen to take advantage of the state's loan subsidy offer to reduce the excess consumption of natural gas and electricity. Only the Great Falls Gas Company has voluntarily initiated this low interest conservation loan program.

Consideration should be given to either requiring utilities to participate, or alternately, to providing the interest subsidy to the consumer through the commercial credit system, including banks, savings and loan corporations and credit unions. Under such a program, the state could provide

additional conservation incentives while leaving the utilities out of the loan business.

Recommendation

Montana's legislature should appropriate funds to the Department of Community Affairs for an expanded home weatherization program.

Energy waste and rising utility bills place significant economic hardships on low-income and fixed-income residents. As these energy costs erode the disposable income of low-income families and individuals, their ability to afford necessary energy conservation improvements continually worsens. Significant reductions of energy waste can be achieved with minimal investments in conservation measures such as additions of insulation, weatherstripping of windows and doors, and replacement of broken windows. For the past two years, the nine local Community Action Programs in Montana have conducted weatherization programs which employ construction labor teams to modify homes of low-income people for improved energy conservation. This program has effectively lessened the financial strain of escalating utility bills upon these families and saved a significant amount of scarce energy resources.

Recommendation

The legislature should enact an income tax credit for taxpayers who purchase or construct and install renewable energy conversion and storage systems on their principal residence, farm or commercial buildings, or for taxpayers who acquire title to property equipped with such renewable energy

systems for which the credit has not been claimed. The credit could be provided on a declining scale basis.

Such a program, adopted for a limited number of years, could reduce consumer risk and uncertainty during the early phases of the shift to renewable energy. Later, the higher fossil energy prices and demonstrated performance of renewable energy systems would remove the need for a subsidy.

## PUBLIC PARTICIPATION

As world energy prices continue their rise, and as conventional sources are depleted, governmental decision-makers will be forced to select from among a variety of sometimes painful and potentially unpopular options. Government officials in such a situation need the advice and support of an informed public.

An energy policy designed to promote the wisest use of remaining non-renewable fuels through voluntary conservation and individual initiative in tapping renewable resources is doomed unless the public is fully informed and actively involved in its development.

The people can be frustrated in their search for the best course of action by the lack of a complete and objective description of the situation, the attainable options, and their consequences. Such information should be provided by state government.

Several attempts have been made to encourage public participation in Montana's governmental affairs. One vehicle promoting such participation is the Montana Environmental Policy Act (MEPA). MEPA gives the public the opportunity to comment on government actions that could potentially cause a significant impact on the human environment. However, the extent to which MEPA involves the public in energy decisions has been limited in that the public has only been given the opportunity to comment on specific proposed actions, rather than on the creation of an overall policy that would guide future projects.

To promote broader public involvement, Governor Judge, in March 1976, created the Citizens' Advisory Committee on Energy (CACE) (23). The task of CACE is to increase citizen participation in the process of developing the state's energy policies. Subcommittees have been formed to deal with

conservation, alternative energy and technology, legal issues and natural gas reserves. Unfortunately, CACE has been hindered by the lack of funding.

Solutions satisfactory to the greatest number must be developed through the cooperation of an informed public and responsive government. The failure of either government or the public to do its part will result in less than the best energy policy.

## Recommendation

The executive branch of state government should competently inform the public on the facts surrounding energy issues, with particular emphasis on energy conservation, and should develop and apply effective means for including an informed public in the energy policy process.

State and other energy documents should be made publically available through the state network of libraries, and techniques should be developed to inform the public of their availability. The communications media, and especially television, should be used to inform and educate the public regarding the energy situation. The use of televised public service announcements to present a well developed media campaign should be considered, especially for conservation information.

Hearings, workshops or other appropriate meetings with the general public or with special interest groups should be held on a systematic basis, as deemed necessary on the basis of experience.

Traditional methods of soliciting public opinion and public participation have had limited success. The state should seek innovative methods of public information and involvement, and should creatively work with the

public in facing these challenging issues.

## Recommendation

The Montana legislature should act to insure the participation of Montana citizens in, and interim legislative review of, executive branch decision-making on energy issues.

An advisory organization, similar to the Citizens' Advisory Committee on Energy, and representing the major views of the Montana citizenry on energy issues, should be formed and funded on a continuing basis. In addition, an interim legislative committee should regularly review the efforts of ERPO and other executive agencies in dealing with the state's energy situation. Special review should be made of state government's success in fostering public participation in the energy policy process. An existing legislative body, such as the Environmental Quality Council, could be designated to provide this review.

## ENERGY DATA AND ANALYSIS (12)

State government cannot act wisely on energy matters in the state unless it has access to valid information concerning the energy situation.

At present, there is no central collection point for energy information in Montana. However, a vast amount of information concerning energy reserves, supply and demand is available from state and federal agencies and private enterprise. Unless it is systematically assembled and coherently related, however, much of the existing information is of limited use for making decisions.

Although the comprehensive assembly and evaluation of existing data is essential to the formulation and implementation of a state energy policy, this would be only a first step toward dealing with the energy problems of the future. Equally important is the need for state government to stay abreast of the continually fluctuating state and national energy picture. With an adequate information base, state government energy analysts could and should begin to formulate policies and programs to deal constructively with anticipated future energy issues, and thereby take a more active role in planning the energy future of Montana.

State government, private enterprise, and the public cannot act in their respective roles to best satisfy the energy needs of Montana, unless they are aware of developments pertaining to the energy situation.

### Recommendation

The Energy and Resource Policy Office should be funded to employ staff and contracted services capable of analyzing various energy questions to

derive information vital to government decision-makers and the public in selecting energy options.

With access to existing computer systems and a comprehensive energy data base (12), a properly staffed policy office could perform a wide variety of analyses of Montana's current and future energy situation and closely monitor the effectiveness of energy conservation programs. ERPO should be directed and funded to prepare an annual long-range projection of the supply and demand for energy in Montana. Further, to insure consistency among various state government forecasts, these projections, after review of forecast methodology by other state agencies and the public, should form the basis for planning in energy-related matters by all state agencies, unless otherwise demonstrated to be inadequate or inappropriate.

### Recommendation

Additional funding should be made available for the staff of the Public Service Commission (PSC) to insure the timely and equitable regulation of Montana's energy utilities. Further, the legislature should appropriate sufficient funds to the PSC for an in-depth study of alternate rate structures, including a detailed cost of service study, for Montana natural gas and electric utilities.

Thorough regulatory review of utility rate requests is essential. However, unnecessarily long delays and policy uncertainties in the regulation of Montana's energy utilities are not in the best interests of the state, the utility or the consumer. Increased staff funding for the PSC should enable

the review time for utility rate applications to be shortened without sacrificing the depth of study necessary to insure equitable decisions. In addition, there has been much comment that existing utility rate structures promote energy usage in a time of shortage, and do not provide the most equitable sharing of the true costs of service. The Montana PSC should be adequately funded to explore the costs and benefits of innovative rate structures for the state's energy utilities.

## SITING OF ENERGY FACILITIES

Montana has no consistent and comprehensive policy to guide the future siting of energy facilities in the state. A siting policy must consider the relative merits of various siting options available and must provide a system for determining whether any specific site is suitable for some proposed energy-related purpose. There also must be a concisely developed outline describing the data required to make siting determinations and the relative importance of these data in determining site suitability.

Montana's siting activities are presently regulated by the Major Facility Siting Act which states that no power or energy conversion facility may be constructed or operated within the state without a certificate of environmental compatibility and public need. State involvement in the siting of energy facilities has been limited to the evaluation of individual facility applications for specific sites. This process has not provided the state or potential applicants with a frame of reference for evaluating the relative suitability of a proposed site nor has it encouraged comparison of proposed sites with potentially suitable alternative sites. This situation has required substantial investments in detailed, site-specific plant design studies and environmental investigations with no guidelines to assure that the site represents an optimum choice or that it will receive favorable consideration under the siting act. It is important that efficiency in government regulation be promoted and applicant interests be accommodated.

## Recommendation

The Major Facility Siting Act should be amended to require that a special task force be created and funded by the legislature to develop criteria to be utilized in a statewide siting inventory and to assume oversight responsibility for the inventory effort. The criteria ultimately developed and utilized by the task force should be formally included in the rules and regulations of the Major Facility Siting Act.

This recommendation recognizes the need for comprehensive long-range planning in the siting of energy conversion facilities. Its implementation will assist regulatory agencies and applicants in making choices at the beginning of the siting process.

A siting inventory must be based upon a series of criteria which identify and categorize the complex information needed to compare and evaluate geographic areas in terms of their relative suitability for energy facility siting. Development of adequate siting criteria will be a major effort in itself which will determine the subsequent quality of the siting inventory. A special consideration of the task force should be the establishment of exclusion and avoidance criteria categories which, respectively, would classify land uses and areas where siting would be absolutely prohibited or permitted only in the absence of reasonable alternatives.

The task force should represent the wide range of interest groups concerned with siting decisions, including at least the public at large, county and local governments, industry, utilities and agriculture. Additionally, the task force should be authorized to investigate or fund

the investigation of several topics which will require development of appropriate criteria, but which will require in-depth study before recommendations may be made.. These topics include the transboundary effect of siting facilities near interstate or international boundaries; the synergistic effect of siting two or more types of energy conversion facilities in close proximity; and the indirect impacts of siting created by increased economic activity and development in a site area.

The task force should be assisted and advised by all governmental agencies having expertise or regulatory responsibilities affected by siting decisions. However, potential future conflicts of interest, especially within regulatory agencies will be avoided if a task force independent of these agencies is responsible for the criteria selection. Additionally, the cooperation and participation of federal government agencies with land and resource-related jurisdictions must be sought and encouraged, but the state must assume final responsibility for its siting decisions. The federal government must not be given any veto power over state decision making.

## Recommendation

One state agency should be designated the resource data assembly and storage unit, charged with the maintenance of resource data files to meet the planning and decision-making needs of other state agencies, county and local governmental units, and the widest possible range of other uses.

A general lack of interagency coordination and the preoccupation

of each agency with its own area of responsibility has resulted in fragmentation of responses to land use and resource management problems (14). These types of problems, by nature, involve many complex, overlapping concerns which it has been impossible to consolidate administratively. The information needed to solve these problems may potentially be applied in many different contexts by different agencies, but current data collection efforts have resulted in nonstandardization of resource information. In turn, coordinated use of the information has been hindered. The above recommendation would provide a means of correcting this situation.

It should be noted that the site inventory effort will require reliable, standardized statewide information in many data categories. Depending upon scheduling and other decisions, the implementation of that site inventory recommendation and the above data assembly and storage recommendation would be highly complementary.

### Recommendation

The Major Facility Siting Act should be amended to adopt broad spectrum public participation as a principle of operation.

The forms of participation should not be limited to public hearings, but should also include advisory committees to work closely with the state siting agency in the power plant siting and transmission line routing processes. This policy would also apply to the activities of the siting inventory task force.

Recommendation

The siting act should be amended to require the filing of a notice of intent to file an application for a certificate of environmental compatibility and public need for a major energy facility at least twelve months prior to the actual filing of an application. This notice must disclose the specific site location being considered for the proposed facility.

A specific enforcement clause should be added to the siting act which would impose severe penalties upon any person who knowingly submits false or misleading information in the ten-year plan.

These two provisions would serve short-term site planning needs prior to completion of the siting inventory; however, they should not be viewed solely in this context. The notice of intent would provide greater opportunity for public review and input into site location decisions and would allow the state and the applicant to confer on the suitability of a given site and identify problems as well as areas of agreement prior to the actual application process. This would streamline the process and eliminate major delays following application. The enforcement clause is designed to insure compliance with the intent of the ten-year utility long-range plans presently required by the siting act. These plans are the state's principal source of information regarding future plans for the construction of energy facilities and their proposed general locations.

# ENERGY TRANSPORTATION

Montana's existing energy transportation systems play a fundamental role in distributing the flows of energy both within the state and to and from other regions. The locations of the state's major crude oil, petroleum products, and natural gas pipeline systems strongly influence both the exploration for oil and gas and their potential market areas. Similarly, since all of Montana's coal for export is carried by train, the existing rail system greatly influences the market area for Montana coal.

Significant changes or additions to the existing energy transportation systems can be expected to develop in at least three major areas. First, rapidly increasing demands for Montana coal by consumers in other states will necessitate increased rail transport or new coal transportation systems such as coal slurry pipelines. Secondly, due to the curtailment of natural gas and crude oil imports from Canada, new pipeline systems are being planned for the delivery of gas and oil from Alaska (or other sources) through Montana to United States consumers. Finally, the potential exists for large discoveries of natural gas in previously unproductive areas of Montana, which may lead to the construction of new major gas pipelines.

## Recommendation

State government should encourage and support the existing railroad system as the prime means of exporting coal from Montana. The current designation of slurry pipeline operation as a non-beneficial use of water (Montana Water Use Act) should be maintained for the present.

Analysis performed for the energy policy study (15) indicates that with reasonable upgrading (including additional safety equipment), existing rail routes in Montana can support the expected level of coal export from the state for the foreseeable future, in a safe and economical manner and consistent with a policy of providing greater employment opportunity. Therefore, at this time, coal slurry pipelines do not appear to be necessary or desirable in fulfilling the state's responsibility to satisfy the demand for Montana coal.

Recommendation

The State of Montana should assure that the safety of its people and property is not jeopardized by the increased rail transport of coal in Montana.

Increases in coal unit train traffic through Montana could create safety hazards. The past efforts of state government and private industry in installing safety equipment should be commended, and encouraged to proceed at an accelerated pace. Additional funds that may be necessary to obtain federal financial support to improve crossing safety should be appropriated.

Recommendation

The Major Facility Siting Act should be amended to include jurisdiction over the siting of major oil and natural gas pipelines.

With the potential for new major transmission pipelines to be built in Montana in the near future, governmental review is necessary to insure that the design and route of these pipelines are selected to minimize environ-

mental damage and risks and to maximize the long-range benefits to Montana consumers. It is recognized that Montana refineries face an imminent crude oil shortage, due to the curtailment of imports of oil from Canada. Pipeline delivery of Alaskan crude oil to Montana appears to offer the best long-range solution. Montana should support the timely construction of a pipeline system to deliver Alaskan crude oil to Montana refineries, consistent with the legitimate environmental concerns within Montana and other regions. Unnecessary governmental delay in developing a long-term solution is undesirable, so it is further recommended that the time allotted for review by the state for oil and gas pipeline siting be limited to at most one year.

### Recommendation

The legislature should formally endorse the timely construction of a pipeline system to deliver natural gas directly from Alaska to consumers in Montana and other states.

Due to the curtailment of natural gas imports from Canada, Montana consumers face an impending shortage of natural gas. Although estimates of the magnitude and timing of this shortage differ, the availability of Alaskan natural gas would significantly improve the state's supply. An inland pipeline system presents the only feasible way to deliver Alaskan gas to Montana. Recent federal legislation (P.L. 94-586) authorizes the President to select a route. A legislative resolution would notify him of Montana's preference.

# ENERGY EXTRACTION

Energy is found in many different forms in Montana, including oil, natural gas, coal, uranium, hydro, geothermal, solar and a variety of others. Article IX, Sections 1 and 2 of the Montana Constitution provides the basis for the current policy existing in Montana regarding extraction of these natural resources. Laws such as the Montana Strip and Underground Mine Reclamation Act are good examples of its implementation. However, much of the policy on energy extraction is fragmented.

Extraction of Montana's vast coal reserves has been the focus of major discussion and will undoubtedly continue to be so. Nevertheless, it is imperative that the potential of other forms of energy not be forgotten or underestimated.

For example, the decrease in supplies of natural gas to Montana has underlined the need for more exploration in the state. A recent report has estimated that 2 to 7 trillion cubic feet of undiscovered natural gas remain in Montana (17). Recent price increases should serve to insure expanded exploration and development of the state's gas reserves.

Montana needs a consistent energy extraction policy with an eye toward both short- and long-term benefits and uses. In developing this policy, careful attention must be paid not only to supply and demand questions but also to land use and social goals and end-use conservation.

## Recommendation

The Legislature should authorize and fund a study to establish criteria to be used in leasing and siting selections for future energy extraction

mines. As a necessary corollary to this effort, the selective denial characteristics described in Section 9 of the Montana Strip and Underground Mine Reclamation Act must be interpreted and defined.

It would avoid duplication of effort and ensure fiscal responsibility if this establishment of criteria was complementary to and run concurrently with that recommended for major facilities.

The federal government recently has taken the initiative to resume leasing federal coal reserves in the western states. One of the steps in this process is to establish tracts which may be leased. While the federal government has a planning system designed to identify suitable and unsuitable tracts, the State of Montana does not. Thus, by the process of elimination, federal decision-making becomes peremptory.

Montana's uranium reserves are also coming under increasing scrutiny as more nuclear plants come on line and increased supplies are needed. Site selection or suitability criteria are imperative here also.

The Section 9 criteria of the Montana Strip and Underground Mine Reclamation Act, while establishing general guidelines for suitability, have come under increasing criticism for their vagueness and lack of guidance. Both regulators and operators need to know the framework within which they must work. However, the Section 9 criteria should not be deleted or weakened under any circumstances.

### Recommendation

The legislature and executive branch should pass and support a resolution requesting the Congress of the United States to amend the Montana

Enabling Act to provide the recognition of alternative long-term benefits to the State School Trust Fund.

The Enabling Act (25 Stat. 676), approved by the Congress of the United States on February 22, 1889, provides statehood for Montana and includes the granting of Sections 16 and 36 in every township in Montana for the support of the common schools. Similar grants were made for other state and educational activities. The Montana Constitution (Article X, Section 4) gives the State Land Board the authority to administer those trust lands. The administration is through the Commissioner and Department of State Lands.

Currently it is the position of the Department of State Lands that the Enabling Act and certain sections of Title 81 (R.C.M. 1947) require that the "largest legitimate monetary return to the trust" (24) be made. This interpretation does not recognize long-term benefits which may outweigh short-term economic gains. Since the Enabling Act does not define exactly what is meant by support of the common schools, it is subject to interpretation. Clarification is needed in the Act.

The recommended resolution is necessary to allow the Department of State Lands to better follow the policies laid down by the Montana Constitution and its implementing legislation, while still maintaining the purpose of the trust fund.

## Recommendation

The legislature shall direct an independent task force study on the characteristics and importance of valley floors of eastern Montana and the

mining feasibility thereof with a report and recommendations to be made to the 1979 legislature.

Until the conclusion of the 1979 legislative session, no surface mining permits should be granted in cases where such permits would lead to disturbance of the following agriculturally and hydrologically important valley floor areas of eastern Montana:

(1) The alluvial deposits of the valleys of the existing courses of the Yellowstone and Missouri Rivers.

(2) The alluvial deposits of the valleys of the existing streams tributary to the Yellowstone and Missouri Rivers where hay is currently produced, to the most upstream points of hay production.

(3) The alluvial deposits of the valleys of the existing streams tributary to the Tongue, Powder and Redwater Rivers and the Big Dry Arm of Fort Peck Reservoir where hay is produced currently, to the most upstream point of hay production.

The valley floors cited are those major valley areas with demonstrated agricultural use, and the related downstream geohydrologic system. These areas are protected until definitive results show which valley floors can and cannot be mined, and how they can be mined.

The possible adverse, off-site impacts of valley floor mining include detrimental changes to the erosion/sedimentation characteristics of streams, detrimental water quality changes including increases to alluvial groundwater salinity in areas of McCone, Dawson and nearby counties, detrimental water quantity problems affecting surface availability of groundwater, and ground stability problems leading to subsidence of "reclaimed" areas.

The valley floors of eastern Montana are the customary sites of hay production for local ranchers. These areas are also the most important range sites for forage production. Although comprising less than three percent of the total land area, these valley floor areas often are the backbone of a ranching operation.

Mapping of alluvial valley floors shows that 2.7 percent of the land overlying the strippable coal reserves of a 2,445.29 square mile area of the Powder River Basin in Montana consists of alluvial valley floors (20), that 3.5 percent of the existing leased coal land in Montana includes alluvial valley floors (18) and that a small percentage of the strippable coal reserves of McCone, Garfield and Dawson Counties are overlain by alluvial valley floors (8). Thus, sufficient quantities of coal exist outside of the areas affected by the recommendation to insure that coal production is not limited, but perhaps only shifted slightly geographically.

## Recommendation

State government should appraise the opportunities for direct use of the earth's heat in agriculture, industrial processes and the heating and cooling of buildings. The legislature should encourage the use of such heat through public information, zoning laws, building codes and financial incentives.

Heat applications of temperatures less than 250 degrees C (typical of geothermal formations) account for 40 percent of total United States energy consumption (26). This heat is now supplied by natural gas, fuel oil, coal and electricity. The work potential of these high grade fuels is largely

wasted when consumed for such low temperature purposes. This inefficient use may be unavoidable when no other adequate heat source is available. However, in west and central Montana, there are a number of prospectively valuable geothermal areas that may be developed for direct low grade heat purposes, the most efficient use of the earth's heat (26).

## Recommendation

The coal severance tax should be maintained at the current rate.

Analysis performed for the energy policy study indicates that the Montana coal tax structure is equitable in providing needed revenues for the state and does not block coal development in Montana. The tax serves a two-fold purpose. First, it provides a trust for future generations to draw on when the nonrenewable resource is depleted. Secondly, it provides immediate funds to assist impacted areas to deal with the social and economic problems brought inevitably by development in unpopulated areas.

The Coal Severance Tax at its current level represents only a small percentage of the delivered cost of coal, and a still smaller fraction of the cost of electricity to the end user. Clearly, the current proposals for coal mine expansions and the active interest in renewed coal leasing in Montana indicate that the demand for Montana coal remains substantial. Montana has been a leader in establishing reasonable controls for coal strip mining. It now appears that other western coal-producing states, as well as the federal government, may soon follow the same path.

## CONVERSION

Energy conversion is the alteration of the physical or chemical nature of energy into another form for ease in use or movement. Examples include the conversion of coal into electricity, crude oil to gasoline, and radiant solar energy to usable heat.

Two issues are particularly relevant to the formation of a conversion policy for Montana. The first is the question of whether coal should be converted to electricity or synthetic gas at or near the mines in Montana or near the various out-of-state load centers.

The second issue deals more with the needs of Montana, and concerns the relative desirability of centralized versus decentralized conversion. In centralized conversion, the facilities are rather large and provide energy to relatively wide areas. In decentralized conversion, the facilities are smaller and provide energy to smaller localities, such as individual towns, neighborhoods or homes.

Although patterns of energy conversion and use in Montana are changing in response to changing prices and availability of energy, the state has neither established a long-term conversion policy nor exercised any leadership in directing movement on this front.

### Recommendation

The legislature should move to discourage the conversion of coal to other energy forms within Montana for export to other areas. Conversion within Montana should be for Montana needs.

Large coal conversion facilities have been demonstrated to have sub-

stantial short- and long-term social, economic and environmental effects on the area of development. Construction work forces in sparsely populated rural areas produce boom towns. Air pollution presents a threat to plant and animal life in the semi-arid plains. Unless dry cooling is used, water consumption can be substantial. By discouraging export conversion facilities while not unnecessarily obstructing coal mining for export, it is possible for Montana to shoulder its fair share of the national energy burden without unduly sacrificing its social, environmental and economic way of life.

In supporting this recommendation, the legislature should consider passage of a resolution of support and possible amendment of the Major Facility Siting Act.

## Recommendation

The State of Montana should make a firm commitment to the development and use of renewable energy.

Studies demonstrate substantial potential in Montana for the application of direct solar, wind, wood, small-scale hydropower, and solid waste as alternative sources of energy (11, 21,25,27). Such technologies rely on renewable energy flows that are always present whether used or not. such as sun, wind and vegetation; in other words, on energy income, not on depletable energy capital. They are diverse, flexible, relatively low-technology, can be matched to need in scale and geographic distribution (taking advantage of the free distribution of most natural energy flows) and are matched in energy quality to end-use needs (19).

Senate Bill 86, the state's renewable energy research, development and demonstration program, should continue. This program, which has now

funded over 30 renewable energy projects in Montana, is an excellent avenue to demonstrate the effectiveness of renewable energy in Montana.

The Renewable Resource Development Act (89-3601 et. seq.), which provides capital assistance to the development of renewable resources, should continue. The Department of Natural Resources and Conservation and the Department of Administration should be instructed to place greater emphasis on renewable energy in loans and grants to both individuals and government.

The tax credit for renewable energy systems recommended in the conservation section should be considered.

A solar and wind data program should be established to identify the potential for solar and wind applications throughout Montana.

Actions should be taken to authorize and encourage local governments and other groups to establish decentralized renewable energy systems to supplement present energy supply systems.

Montana should support at every opportunity the establishment of safe bikeways coordinated with its urban, rural and intercity transportation systems; the improvement of bicycle safety education and standards; and community planning which makes it both safe and convenient to walk and bicycle.

Recommendation

The state should permit and encourage shifts from natural gas and oil to coal where environmental standards can be met.

Nonrenewable forms of energy will plan a critical role in the transi-

tion to a renewable-based energy economy. With rising prices and declining supplies of oil and gas, the direct burning of coal is a reasonable fuel alternative in many industrial applications. Several major Montana gas users are switching to coal. Coal burning technologies are undergoing a virtual revolution, including the development of the fluidized bed system (3).

Environmental standards (primarily air pollution) are critical, and must be met. For industrial uses this can be done. Smaller applications such as home heating present problems. In rural areas, particularly eastern Montana where weather and topography disperse air pollution, coal burning for space heating can be acceptable. Because of the concentration of pollution, the use of coal for home heat in urban areas, especially those which presently have an air pollution problem, should be avoided.

The legislature should consider appropriating funds to support research on clean and more efficient methods of direct coal burning for residential and other small-scale uses.

## Recommendation

State government should oppose large-scale radioactive waste disposal in Montana.

There are two functioning radioactive waste disposal sites in Montana, accommodating small amounts of waste from research at Montana State University and a USDA agricultural research center. There is no large-scale disposal of nuclear waste in the state, although the federal government recently moved to have the state studied to determine its suitability for

large-scale waste disposal. Montana has no nuclear generation or nuclear fuel processing, and makes a considerable sacrifice by exporting more than 90 percent of its coal for the energy needs of the nation. The state should not be required to make the further sacrifice of furnishing nuclear waste disposal space.

Although Montana has been mentioned as a possible site for nuclear generation and fuel enrichment, there are no known plans to construct nuclear facilities in the state. Considering that the risks of nuclear generation and fuel reprocessing are the subject of intense national and international debate, Montana should continue to monitor the progress of research and experience with nuclear technology to aid the state if it must some day make a decision relating to nuclear energy.

Both nuclear generation and fuel enrichment plants are covered by the Major Facility Siting Act, and should continue to be.

### Recommendation

The legislature should take action to improve the conversion efficiencies of large-scale conversion facilities.

Present large-scale coal conversion facilities waste nearly two-thirds of the energy in the conversion process. Certain current and developing technologies hold promise for improving conversion efficiencies. These include waste heat utilization in electrical generation, co-generation of electricity in industrial boilers, and fluidized bed boilers. The legislature should consider amendment of the Major Facility Siting Act to allow the state to require waste heat utilization. Laws and rules regarding in-

dustrial co-generation should be examined for possible amendment.

Recommendation

The State of Montana should provide neither financial support nor backing for a coal gasification plant at this time, nor should any special legislative concessions be granted to such a proposal.

Gasification technology is uncertain and at best provides energy at prices higher than what should be tolerated by the consumers of this state. There are other alternatives which are more certain and lower in cost that can be implemented, including energy conservation, industrial shifts to coal and expanded natural gas production (3, 7, 17, 22, 23).

This recommendation pertains only to state financial backing of a gasification plant. Any application by Montana's public utilities to construct a plant for Montana's needs without state financial backing should be given the appropriate consideration under the Major Facility Siting Act.

State financial backing of a gasification plant for export markets should be opposed. Such opposition is consistent with the export only policy recommended on page 33.

# A PROPOSED MONTANA ENERGY POLICY

Continued growth in demand for nonrenewable energy forms poses a serious and immediate problem. It is essential that future generations not be left a legacy of depleted resources with resultant environmental, social and financial impact. It is the goal of Montana to promote the efficient use of energy and to develop permanently sustainable energy and other renewable resources. The need exists for comprehensive state leadership in determining the direction of Montana's energy future. It is, therefore, the policy of Montana:

That the private sector be encouraged to develop a diverse array of permanently sustainable energy resources;

That through state and local government example and other effective means, energy conservation and elimination of wasteful and uneconomical uses of energy and materials be promoted;

That the basic human needs of every Montana citizen, present and future, shall be given priority in the allocation of energy resources, commensurate with perpetuation of a free and productive economy with special attention to the preservation and enhancement of environmental quality;

That state government shall provide a source of impartial information, making ample use of the resources of the state university system, to enhance this energy policy;

That Montana will not shirk its responsibility to provide coal to a conservation conscious nation, but will insist upon orderly and considered development in the long-term best interests of Montana's people and its resources, including discouraging the conversion of coal to other energy forms for export to other areas; and

That the people of Montana and state government act to assure a quality life for present and future generations.

APPENDIX A

UNITED STATES OF AMERICA, )
State of Montana ) ss.

I, FRANK MURRAY, Secretary of State of the State of Montana, do hereby certify that the following is a true and correct copy of HOUSE Bill No. 453, Chapter No. 517, Montana Session Laws of 1975, enacted by the Forty-fourth Legislature of the State of Montana, approved by Thomas L. Judge, Governor of said State, on the twenty-ninth day of April, 1975, and effective immediately.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the great Seal of said State.

Done at the City of Helena, the Capital of said State, this first day of May, 1975.

Frank Murray

Frank Murray
Secretary of State

. . . . . . . . . . . . . . . . . . . . . . .

CHAPTER NO. 517
MONTANA SESSION LAWS 1975
HOUSE BILL NO. 453

AN ACT PROVIDING FOR THE SUSPENSION OF ACTION ON CERTAIN APPLICATIONS FOR CERTIFICATES OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED DURING WHICH TIME A COMPREHENSIVE MONTANA ENERGY POLICY AND PLAN SHALL BE FORMULATED; AND PROVIDING FOR AN IMMEDIATE EFFECTIVE DATE.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MONTANA:

Section 1. Statement of legislative findings and policy. The legislature, noting the apparent federal initiative for energy conversion facilities and further noting their complex economic, social and environmental impacts as well as the lack of clearly defined state energy conversion objectives, policies, and plans, finds that energy conversion facility siting must be restrained until such state objectives, policies, and plans are defined, developed, and subjected to citizen participation and review. The legislature further finds that action on individual utility siting applications without a comprehensive program could lead to economic, social, and environmental disruption in their cumulative impact. The legislature pursuant to its mandate and authority under Article IX of the Montana constitution declares that it is the policy of this state that until a comprehensive state energy conversion policy and plan is developed and accepted, the siting of certain energy conversion facilities shall be suspended.

Section 2. Definitions. Unless the context clearly requires otherwise, in this act:

(1) "Board" means the board of natural resources and conservation.

(2) "Application" means an application for a certificate of environmental compatibility and public need under the Montana Utility Siting Act of 1973 for only a utility facility:

(a) designated for, or capable of, generating at fifty (50) megawatts of electricity or more or any addition thereto (except pollution control facilities approved by the department of health and environmental sciences added to an existing plant) having an estimated cost in excess of two hundred fifty thousand dollars ($250,000), or

(b) designed for, or capable of, producing one hundred million (100,000,000) cubic feet of gas per day or more, or any addition thereto, having an estimated cost in excess of two hundred fifty thousand dollars ($250,000), or

(c) designed for, or capable of, producing fifty thousand (50,000) barrels of liquid hydrocarbon products per day or more or any addition thereto having an estimated cost in excess of two hundred fifty thousand dollars ($250,000), or

(d) designed for or capable of enriching uranium minerals.

(3) "Department" means the department of natural resources and conservation.

(4) "Certificate" means certificate of environmental compatibility and public need.

Section 3. Suspension of action. (1) Once the board has granted a certificate for a utility facility as described in section 2 of this act the department shall not accept or act upon any application until:

(a) the governor of the state of Montana has prepared and submitted directly to the next legislature a long-term, comprehensive state energy conversion policy and plan including but not limited to alternative long-term growth goals, a statewide siting inventory, and a proposed siting policy for the coordinated siting of energy conversion facilities to meet Montana's energy needs,

(b) the next legislature of the state of Montana has had an opportunity to respond to the policy and plan with appropriate legislation.

(2) Provided that this act does not apply to any application accepted by the department prior to passage and approval of this act.

Section 4. The board may suspend action on applications not meeting the definition of application in section 2 of this act if it determines, after a public hearing conducted under the contested case procedures of the Montana Administrative Procedure Act, that the cumulative impact of those applications, if granted, would be contrary to the policies and purposes of this act.

Section 5. The board may take action on applications meeting the definition of application in section 2 of this act if it determines, after a public hearing conducted under the contested case procedures of the Montana Administrative Procedure Act, that (1) the facility is required to meet state energy needs, or (2) upon a clear and convincing showing by the applicant the burden imposed on interstate commerce outweighs the adverse impacts of the proposed facility on the public health, safety, general welfare and environment of the state of Montana.

Section 6. Severability. If a part of this act is invalid, all valid parts that are severable from the invalid part remain in effect. If a part of this act is invalid in one or more of its applications, the part remains in effect in all valid applications that are severable from the invalid applications.

Section 7. Effective date. This act is effective on passage and approval and is repealed two (2) years after that date.

APPENDIX B

State of Montana
Office of The Governor
Helena 59601

THOMAS L. JUDGE
GOVERNOR

RECEIVED
AUG 6 1975

August 4, 1975

The Honorable Bill Christiansen
Lieutenant Governor
State Capitol
Helena, Montana 59601

Dear Bill:

As you are aware, the last session of the Legislature passed, and I signed into law, House Bill 453, which provides for a suspension of action on certain applications under the Major Facility Siting Act, and mandates me to formulate an energy conversion policy and plan. That energy policy and plan must be both long-term and comprehensive, and must consider alternative long-term growth goals, a statewide siting inventory, and a proposed siting policy for the coordinated siting of energy conversion facilities to meet Montana's energy needs.

I would like you, as Chairman of the Montana Energy Advisory Council (MEAC), to direct the efforts of MEAC and MEAC agencies in fulfilling the mandate. I am expanding the mandate, however. I want the activities of MEAC under H.B. 453 to be your major project during this biennium, and I want the energy policy and plan to be formulated in such a fashion that it will serve as a basis for the continuing development and implementation of substantive energy and growth policies for the State of Montana, including energy conservation and renewable energy sources.

You must deal with the matter of long-term growth goals. This includes articulating courses which could be taken, considering the implications of these possible courses, and acting to ensure meaningful citizen involvement throughout. I expect you to work closely with the Montana Futures Process which is being headed by my Office of Budget and Program Planning. I am assigning you the chief responsibility in my administration for the consideration of long-term growth objectives.

Because there are many state agencies, as well as federal, with an interest and responsibility in the area of energy and growth, coordination of possibly divergent efforts assumes importance. I am delegating to you the responsibility and authority to direct the executive MEAC agencies of Montana government in the carrying out of this task. This includes resolution of inter-agency differences on who should do what, how it should be done, and so forth. We cannot afford the costs in time and energy which accompany such lesser difficulties in the face of the massive pressures at hand.

The Honorable Bill Christiansen
August 4, 1975
Page Two

To be more specific, I would like this effort to include the following:

(1) A comprehensive assessment of the energy data situation for Montana: This should include a detailed inventory of all energy data available from state and federal sources, an up-to-date summary of the most important data (to enable us to deal with the situation facing the next legislative session) and very specific recommendations for a continuing energy data storage, retrieval and analysis program. The recommendations should reflect a critical assessment of the adequacy and reliability of our present energy data base. For the various forms of energy in Montana, we should have information on production, consumption, processing, prices, reserves, and so forth.

(2) A broad assessment of the energy-related data situation for Montana: Energy-related data refers to information which is not strictly energy in nature, but which is related, such as land capability and use; water quality, quantity, and use; air quality; plant, wildlife and aquatic biota information; and human resource concerns, such as economic analyses, population characteristics, and desires of our citizens, and energy impact on government, political and community structures and services.

(3) As a follow-on to (1) and (2) above, once we know the status of our physical and natural systems we can then begin the statewide siting inventory. The Legislature has not appropriated funds to perform this very expensive and complex task, so it will be necessary for MEAC and MEAC agencies to get the very most out of your limited resources, and to intensively search through federal sources for any and all forms of assistance which can be brought to bear on this assignment. As an adjunct, I want you to be prepared with recommendations on any needed changes in our natural and human resource data and analytic efforts which would require legislative action -- either substantive changes or recommended budget priorities.

You may consider this assignment to include my expectation that the work of the Glasgow Gasification Task Force will provide significant and meaningful input into your efforts.

In carrying out this massive assignment, you will have the full support of my office. I expect you to report to me in writing, on a bi-monthly basis, on your progress.

Sincerely,

Thomas Judge

Thomas L. Judge
Governor

sb

## APPENDIX C MONTANA ENERGY OVERVIEW

Montana has been richly endowed with substantial energy resources. Significant volumes of natural gas and crude oil, as well as massive deposits of subbituminous coal and lignite, are known to exist beneath much of the state. Coal accounts for over 99 per cent of the known fossil fuel reserves in Montana, underscoring the significant part that coal will play in the energy future of the state. In addition, Montana's rivers provide an important source of energy for the production of electricity.

Montana historically has been an intensively resource extractive state. The abundant evergy reserves of the state have been and continue to be drawn upon at significant levels; per capita production of energy in Montana during 1974 was about 2.8 times that of the nation as a whole. The substantial development of fossil fuel resources now has made Montana a large exporter of fossil fuel energy. But, even though Montana produces almost two and one-half times as much energy as the state consumes, large and very important quantities of energy are imported from other states and Canada. Of course, not all forms of energy are immediately interchangeable, due to physical, environmental and economic differences among various fuels.

There are several reasons for the simultaneous export and import of fuels including resource ownership patterns and limitations due to existing transportation facilities (particularly crude oil pipelines). Varying peak demands for electricity in the region also make Montana both an importer and exporter of electrical energy. Also, the oil refineries in Montana, concentrated in the Billings area, export large volumes of refined petroleum products to

neighboring states.

Production and exports of energy are dominated by the recent coal development in the state. In the past two years, coal has replaced crude oil as the major form of energy production in Montana. Also of great importance and concern are the large imports of crude oil and natural gas, most of which come from Canada and at this time are very uncertain sources for the future. It should be noted that fossil fuel exports in fact exceeded the state's production in 1975, due to the export of petroleum products refined largely from imported crude oil.

Despite the immense coal reserves of Montana and the recent increases in coal production in this state, coal continues to provide a very small percentage of the energy consumed in Montana, accounting for about 7 per cent of total energy consumption in 1975. Petroleum products provide the largest energy source in Montana, as is the case for the nation. Consumption of petroleum products is dominated by the use of motor gasoline for private and commercial transportation. The transportation sector is the largest consumer in Montana, with the remainder of energy use almost equally split between the industrial sector and the combined residential/commercial sector. Industry in Montana, over the past decade, has been the fastest growing energy consuming sector, and also is the most variable. Energy use by Montana's industries is highly concentrated in a very few consumers, most notably the producers of copper and aluminum.

Even though energy consumption in Montana is small compared to the state's production, it is by no means insignificant. Gross consumption of energy per capita in Montana in 1974 was about 440 million British Thermal Units (BTUs) or the energy equivalent of 3,500 gallons of gasoline used for every person

in the state. This is significantly greater than the national average per capita gross consumption of 340 million BTUs, primarily due to the greater concentration of industry per capita in Montana compared to the nation. Per capita consumption of energy in Montana grew at a rate of about 3 percent per year from 1960 to 1970, slowing to around 2 percent per year from 1970 to 1973, and grew at a still slower pace, about 1 percent per year, from 1973 to the present. This trend has been influenced by many variables including recently rising energy prices, conservation, and the nationwide slowdown in economic activity.

## Petroleum

In the last five years, Montana crude oil production has been relatively stable at about 34 million barrels per year. Montana proven reserves of crude petroleum as of December 31, 1975, are variously estimated at from 164 million barrels by the American Petroleum Institute (API) to 255 million barrels by the Montana Department of Natural Resources and Conservation (DNR). At 1975 production levels, this would leave the state with from five to seven years of production before presently known recoverable reserves were depleted. Due to transportation limitations, only about 36 percent of these known reserves, or 91.2 million barrels (DNR), are available to the major Montana refineries. If all of this fraction of total reserves were immediately available and used by Montana refineries, it would represent less than two years supply at current rates of crude oil throughput.

Montana both imports and exports large volumes of crude oil. In 1975 the source of total crude refined in Montana was 17 percent from Montana production, 40 percent from Wyoming and 43 percent from Canada. The Cana-

dian feedstock is an uncertain source for the future, since the National Energy Board of Canada has announced plans to completely curtail exports of crude oil to United States refineries, similar to actions already initiated for natural gas exports. Plans are currently being formulated to deliver Alaskan crude oil to several northern states, including Montana, to replace the Canadian feedstock. These proposals include: the construction of a Northern Tier pipeline from the Puget Sound area, through Montana, to a Minnesota link with other pipelines; and the construction of a transprovincial pipeline across British Columbia, connecting with existing pipeline systems in Alberta. However, it will probably be several years before any crude oil could be delivered by either route. In the interim, if sufficient crude oil is not available, some Montana refineries may be forced to close, resulting in significant adverse economic impacts to the state. In addition, if the state's refineries cannot continue to operate, it may be necessary to import finished petroleum products, probably at a higher cost to Montana consumers.

Production of crude oil from Northern, Central and Southcentral Montana, the areas that supply Montana refineries, has been relatively stable over the past three dacades, accounting for only about 30 percent of total Montana production in recent years. Major discoveries of crude reserves in the Williston Basin in 1951 and the Powder River Basin in 1966 imposed substantial changes on the state's crude production picture. However, crude produced from these two areas is almost totally dedicated to export, since no pipelines exist to transport it to the major refineries in the Billings area.

The three Billings area refineries have accounted for nearly 90 percent of total Montana refinery output in recent years. All these refineries are heavily dependent on imported Canadian crude oil. The Continental Oil refinery in Billings, in addition to receiving Canadian crude oil, relies for almost one-third of its total inputs on imported Canadian natural gas condensates. (Natural gas condensates are liquid hydrocarbons which are produced in association with natural gas, the liquid fraction being separated by various condensation techniques. They require minimal additional refining, and are close to a "natural gasoline.") Imports of Canadian feedstocks to Montana began in 1962 with the completion of the Glacier pipeline system. Reliance on Canadian inputs has steadily increased, as the refineries expanded and adjusted to the lighter and sweeter (lower sulfur content) Canadian crude oil and condensates. Annual importation of Canadian crude oil and condensates reached a peak of 24.3 million barrels in 1973 and declined slightly to 20.7 million barrels in 1975.

In addition to the three Billings area refineries, three smaller refineries operate in north central Montana and one small refinery is located near Wolf Point. These four plants supply local markets, whereas the Billings refineries produce sufficient quantities of petroleum products to supply most of Montana's needs and also to export 50 percent or more of their production to Washington, Idaho, North Dakota and Wyoming.

Over the past few decades, consumption of petroleum products has increased steadily, with over 60 percent of this energy now used for transportation. The use of motor gasoline constitutes the largest share of the demand for petroleum in Montana, accounting for over 65 percent of transportation energy use, and over 40 percent of total demand for petroleum products in

the state in 1974. The use of motor gasoline has grown, fairly steadily, at an average annual growth rate of close to 3 percent since 1950. Consumption of distillate fuel oils and residual fuel oils has varied widely over the past 25 years, with the use of distillates generally increasing while the use of residuals has been generally decreasing.

## Natural Gas

Known reserves of natural gas in Montana are located predominantly in the eastern and north central portions of the state. The American Gas Association estimates that as of December 31, 1975, total proven recoverable reserves of natural gas, including storage in Montana, were 929.986 billion cubic feet (bcf). At the 1975 level of production and net withdrawal from storage of 53.5 bcf, these known reserves would be depleted in 17 years. Recent discoveries of deep gas in the disturbed belt along the Rocky Mountains in Wyoming coupled with recurring rhetoric favoring Federal Power Commission deregulation of interstate gas prices (which should provide more incentive for exploration and production) give some cause for hope that additional reserves will be discovered and brought into production. However, there is no mechanism for locking new finds into exclusive use in Montana, so that a major new discovery could make Montana a large exporter of natural gas.

These factors, in addition to recent cutbacks in imports of natural gas from Canada, have caused great uncertainty and concern for the state's natural gas supply. Consumers in Montana depend heavily on imports of natural gas. The state is particularly dependent on Canada, and to a lesser degree on Wyoming and North Dakota, for its gas supply.

The state is served by two major utilities: the Montana Power Company (MPC) which provides about 64 percent of total natural gas sales directly to the western two-thirds of the state, with an additional 9 percent of total sales distributed through other utilities; and Montana-Dakota Utilities which provides service to the remaining one-third of the state, with about 26 percent of total Montana natural gas sales. In addition, nine other utilities distribute gas in Montana. Northern Natural Gas Company, since 1972, has been exporting gas produced in the Tiger Ridge area of Hill and Blaine Counties to Minnesota.

The import of Candian natural gas to Montana began in 1952, increased steadily to an annual maximum of 50 bcf in 1973, and has decreased since to 42.2 bcf in 1975. Since 1973, the Canadian National Energy Board has set maximum annual natural gas export volumes. These quotas are reviewed each year, and have been steadily reduced. The most recent export authorization for the Montana Power Company is 34.2 bcf from May 1976 to May 1977. Canadian natural gas is extremely important to the MPC system, accounting for about 73 percent of their total sales in 1975 (including sales for resale, excluding inputs from storage facilities). In response to Canadian export limitations, production of natural gas in Montana by the Montana Power Company has increased to almost 15 bcf during 1975. An additional 65 bcf of gas reserves will begin to supply the MPC system with about 6 bcf per year, with the completion of the Lone Star pipeline in the Fall of 1976.

Montana-Dakota Utilities (MDU) draws on the natural gas resources of North Dakota, South Dakota, Wyoming and Montana for delivery in those states. Wyoming is both the largest producer and smallest consumer of gas in the system; inputs of natural gas from South Dakota are negligible. On a net basis within the MDU system, Montana contributed almost as much as was con-

sumed in the state for this time period. However, this does not reflect the degree to which Montana-produced gas moves out of state within the system, and is in turn replaced primarily by gas from Wyoming. Montana's substantial share of total system production is particularly due to the large underground natural gas storage area in the Baker field of eastern Montana. This storage facility has been very important to the MDU system, allowing winter peak demands to be met by stored gas with the storage replenished during lower summer demands. However, since 1972 a net annual withdrawal of gas from storage has occurred, which if continued may soon begin to place a strain on the system's ability to meet demand.

Production of natural gas in Montana, excluding Tiger Ridge production dedicated to export, declined at an average rate of 5 percent per year from 1970 to 1975.

Natural gas consumption has increased significantly over the past two decades in Montana. The industrial sector has shown the fastest growth in gas use, and is the largest and most variable consuming class. About 76 percent of industrial gas use is within the Montana Power Company system, and is heavily concentrated in a very few industries.

Prices to utilites for natural gas have increased dramatically in the past two years, particularly within the Montana Power Company system. This is primarily due to increases in the import price of Canadian gas. Since July 1, 1974, prices for Canadian natural gas have increased from 33 cents per thousand cubic feet (mcf) to $1.60 per mcf. Recent announcements indicate that these prices will increase to $1.80 per mcf in September 1976 and then to $1.94 per mcf in January 1977. For comparison, recent contracts

for purchases of Montana gas production have been made for about $0.85 per mcf. The price established by the Federal Power Commission for interstate sales of recently developed natural gas has been raised from $0.52 per mcf to $1.42 per mcf (this increase has been temporarily set aside by court action). The expected conversion from natural gas to alternative fuels by several Montana industries will have a noticeable effect on Montana consumption. Conversion to coal by Great Western Sugar and Ideal Cement will save about 0.9 bcf and 2 bcf per year, respectively, and the use of electricity in the Anaconda copper smelter will also save over 2.5 bcf per year. In spite of this, Montana-Dakota Utilities has requested the authority from the Federal Power Commission to curtail gas deliveries to industries during the 1976-1977 heating season by as much as 22 percent.

## Coal

Montana is underlain by massive amounts of easily strippable, low sulfur coal. The Montana Bureau of Mines and Geology estimates the existence of 50 billion-plus tons of strippable lignite and subbituminous coal under overburden of 300 feet or less, in only a part of eastern Montana. The total demonstrated reserve base of Montana coal is estimated to be 108 billion tons, accounting for over 25 percent of known coal reserves in the United States. Even more important, strippable, low sulfur coal reserves in Montana, those containing less than 1 percent sulfur by weight and lying under generally less than 120 feet of overburden, are estimated by the United States Bureau of Mines to amount to over 38 billion tons, or more than half of the nation's strippable, low sulfur reserves of coal. These reserves would last thousands of years at current production rates.

Montana's low sulfur reserves are estimated to be greater than those of all other states combined.

Clearly, coal will continue to have a dominant role in the energy picture in Montana. Much of the nation will look to Montana's coal as a major energy source as other fossil fuels become scarce, and as environmental constraints encourage the use of low sulfur coal, which is produced more economically from western strip mines than from the deep reserves of eastern states. Virtually all of the state's production is exported (94 percent in 1975), principally for electric generation in the Midwest. Even so, a very small amount of coal, about 50,000 tons in 1975, continues to be imported to Montana from Wyoming, Colorado, and Utah for use by a few industries. Most of the coal consumed in the state is for electric power generation in eastern Montana. Consumption of coal in Montana is expected to increase substantially, as new coal-fired generating plants come on line, and as several Montana industries complete their efforts to convert from the use of natural gas to coal.

## Electricity

Development of Montana's rivers has given the state a substantial hydroelectric capability. Total generating capacity in Montana is now 2909 megawatts (MW), of which 1879 MW, or 65 percent, are hydroelectric (including Colstrip Units 1 and 2). Significant additions to this generating capacity are planned or proposed. Thses include Libby Units 5 through 8 and the Libby reregulating dam, which together will add 466 MW of hydro-

electric power, and Colstrip Units 3 and 4, which will add 1400 MW of coal-fired generating capacity (about 30 percent of Colstrip Units 3 and 4 will be available to Montana utilities). This additional power would appear to assure that the state's intermediate-term needs will be satisfied.

The generation of electricity has been dominated by hydroelectric generation. Only recently with the development at Colstrip has coal-fired generation begun to play a major role in Montana power production. With the extensive private and public hydroelectric network, Montana has long produced more electricity on an annual basis than has been consumed in the state. Due to varying peak demands within the region, however, significant interchanges of electric power with other states do occur.

All consuming sectors have shown a steady increase in their use of electricity, with industry being both the largest and the most variable user. In 1975, residential and commerical use accounted for almost 40 percent of the total, with industrial consumption reaching nearly 60 percent. Well over half of the industrial use is in the primary metals industry which includes an aluminum plant at Columbia Falls and a copper smelter at Anaconda. The copper smelter is well underway in a project to replace its natural gas-fired furnaces with a new electric furnace, which will substantially increase its use of electricity. Prices for electricity have been relatively stable in Montana, and well below the national average, principally due to the state's abundant hydroelectric power. Recently, though, deflated average annual prices for electricity in the nation have begun to rise for the first time since 1946. This trend also is apparent in Montana, and can be expected to continue, as the new coal-fired generating

plants increase their share of total electricity produced.

## Other Energy Sources

There have been no discoveries of commercial quality uranium ore in Montana. Adoption of solution mining techniques for development of uranium ores may change the definition of "commercial quality" ore. Should this occur, uranium deposits in Montana could be considered suitable for development. According to the Montana Bureau of Mines and Geology, likely areas for discovery of exploitable uranium ore in Montana lie within the Big Hole drainage, the Ruby Valley and the Carbon County quadrant in eastern Montana. Some quantities of pitchblende have been noted in northwestern Montana near the Idaho border.

Unfortunately, no complete data exist to document the direct use of renewable energy sources in Montana, most notably wood, wind and solar power. Certainly, not too many years past, wood provided a significant share of energy consumed in the state. Recent increases in the prices of nonrenewable energy sources appear to have brought many people back to this abundant, low-cost fuel. Also, within the wood products industries in Montana, wood residues supply an increasing share of energy consumption. Several experimental projects designed to make direct utilization of wind and solar power are underway in the state, which may, in the near future, indicate that these renewable energy sources can provide alternatives for Montanans.

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